STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
800 BAY ROAD
P.O. BOX 778
DOVER, DELAWARE 19903

SHAILEN P. BHATT
SECRETARY

September 9, 2014

Mr. Joseph Caloggero
The Traffic Group, Inc.
Suite H
9900 Franklin Square Drive
Baltimore, MD 21236

Dear Mr. Caloggero,

The Department has completed its review of the Traffic Impact Study (TIS) for the Overbrook Town Center (Tax Parcel 235-23.00-1.00), prepared by The Traffic Group, Inc. (TTG) and dated June 2, 2014. TTG prepared the report in a manner generally consistent with DelDOT's *Standards and Regulations for Subdivision Streets and State Highway Access*.

The TIS evaluates the impacts of the Overbrook Town Center, proposed to be located on the northbound side of Delaware Route 1, north of the City of Lewes in Sussex County.

The proposed development would consist of approximately 857,000 square feet of commercial space, to be developed on an approximately 114.00-acre parcel (Tax Parcel 235-23.00-1.00). Two access points are proposed: a rights-out access point on Delaware Route 1, and a grade-separated intersection with Delaware Route 1 at Cave Neck Road (Sussex Road 88). Construction is anticipated to be complete by 2020.

The land is currently zoned as AR-1 (Agricultural Residential) in Sussex County, and the developer proposes to have the land rezoned to CR-1 (Residential Commercial).

DelDOT maintains the Corridor Capacity Preservation Program (CCPP), which is a statewide program intended to manage and preserve the traffic capacity and safety of adopted highway corridors by various means such as limiting access points and using service roads for local vehicle trips. The general purpose of the program is to ensure that existing principal arterial roadways, such as Delaware Route 1, are able to efficiently carry regional traffic without significant impedance from the effects of local development. The program was established in accordance with the provisions of Title 17, Section 145 of the Delaware Code. DelDOT's CCPP Manager has no objection to the proposed development provided that access to Delaware Route 1 be permitted via the proposed rights-out access point on Delaware Route 1 and a grade-separated intersection with Delaware Route 1 at Cave Neck Road. The access points must adhere to DelDOT's design standards.

Additionally, there is one DelDOT project within the study area, which is the Highway Safety Improvement Program (HSIP) US Route 9 Project. The intersection of US Route 9 and Sweetbriar Road / Dairy Farm Road is part of this project. The goal of the project is to reduce the potential for and severity of crashes at the intersection, as well as to increase capacity at the intersection for future traffic volumes. To accomplish this, it was recommended that the intersection be reconfigured so that each approach contains an exclusive left-turn lane, an exclusive through lane, and an exclusive right-turn lane. Also as part of this work, the east end of Log Cabin Hill Road (Sussex Road 247) is being relocated further north to separate it from southbound queues at the subject intersection. Construction at this intersection is expected to be complete by the end of the 2014 calendar year.

Based on our review, we have the following comments and recommendations:

Per DelDOT's *Standards and Regulations for Subdivision Streets and State Highway Access,* the following intersections analyzed in this study exhibit level of service (LOS) deficiencies without the implementation of physical roadway and / or traffic control improvements:

Intersection	Situations for which deficiencies occur
Delaware Route 1 / North Site Entrance	2020 Saturday Mid-Day peak hour with Overbrook Town Center (OTC)
Delaware Route 1 / Cave Neck Road / South Site Entrance	2013 Saturday Mid-Day peak hour, 2020 PM peak hour with OTC, 2020 Saturday Mid-Day peak hour with and without OTC
Delaware Route 1 / Lockerman Road	2013 Saturday Mid-Day peak hour, 2020 Saturday Mid-Day peak hour with and without OTC
Delaware Route 1 / Hudson Road	2013 PM & Saturday Mid-Day peak hours, 2020 PM & Saturday Mid-Day peak hours with and without OTC
Delaware Route 1 / Eagles Crest Road	2013 Saturday Mid-Day peak hour, 2020 PM & Saturday Mid-Day peak hours with and without OTC
Delaware Route 1 / Minos Conaway Road	2013 Saturday Mid-Day peak hour, 2020 PM & Saturday Mid-Day peak hours with and without OTC
Delaware Route 1 / Nassau Road	2013 Saturday Mid-Day peak hour, 2020 PM peak hour with OTC, 2020 Saturday Mid-Day peak hours with and without OTC
Delaware Route 1 / Nassau Road / Nassau Park Road	2013 PM & Saturday Mid-Day peak hours, 2020 PM & Saturday Mid-Day peak hours with and without OTC
US Route 9 / Minos Conaway Road	2013 Saturday Mid-Day peak hour, 2020 Saturday Mid-Day peak hour with and without OTC
US Route 9 / Sweetbriar Road / Dairy Farm Road	2020 PM & Saturday Mid-Day peak hours with OTC
US Route 9 / Church Street	2020 Saturday Mid-Day peak hour with and without OTC
Cave Neck Road / Sweetbriar Road	2020 PM & Saturday Mid-Day peak hours with OTC

For the intersection of Delaware Route 1, Cave Neck Road and the proposed South Site Entrance, there is already a significant and growing volume of traffic using Cave Neck Road. Even without the subject development, the current stop-controlled operation at this intersection is already inadequate on summer Saturdays and by 2020 we expect that it will be inadequate in the weekday evening peak hour. Because of its location on Delaware Route 1, the CCPP identifies grade-separation as the appropriate remedy. Therefore, we recommend the developer be required to grade-separate this intersection as part of their entrance construction.

While we acknowledge that the installation of a traffic signal would be feasible in some ways, it would necessarily create delays for the through traffic on Delaware Route 1. If, after the developer has made every effort to construct the grade-separated intersection including documented expenditures of up to $8 million dollars, DelDOT would consider installation of a temporary signal. We would consider installing it only on the basis of a signal justification study. A scope of that study is enclosed with this letter. Further, conditions pertaining to the possible installation of a temporary signal at this location are found in the recommendations portion of this letter.

For the intersection of Delaware Route 1 and Minos Conaway Road, a project to address the LOS deficiencies, by improving the grade-separation where Delaware Route 1 crosses the Lewes-Georgetown rail line and routing left-turn traffic there, has been identified in DelDOT's long-range plans for Sussex County. While a developer-funded project could be implemented to address these LOS deficiencies at this intersection now, we are going to require the developer fully fund other necessary improvements, as described above, which are more beneficial to the performance of the transportation infrastructure within the study area. Therefore, we do not recommend that the developer make any improvements at this intersection.

For the intersection of US Route 9, Sweetbriar Road and Dairy Farm Road, an HSIP project has been identified for this intersection, as mentioned above. Since this project is scheduled to be complete by the end of the 2014 calendar year, developer funds that would normally be used for participation in the cost-sharing of this project can be used to a more beneficial use for other improvements that the developer will be required to make, as described below. Therefore, we do not recommend that the developer participate in any improvements at this intersection.

For the intersection of Cave Neck Road and Sweetbriar Road, a left-turn lane will be needed on northbound Sweetbriar Road to accommodate the impacts of traffic bound for the subject development. We recommend that the developer be required to build it.

For the other intersections mentioned above, all of the deficiencies occur as a result of heavy through volumes on the major streets of those intersections. Traffic wishing to turn onto the major street from the minor street at those intersections would need to wait to for a gap in traffic to make a safe and efficient turning maneuver. However, closer inspection of the results of the analysis of those intersections reveals that traffic queues are not excessively long on the minor streets; therefore, reasonable operation of traffic at those intersections can be expected to occur and to continue through the build out of the proposed development. We do not recommend that any improvements be implemented at these intersections.

Should Sussex County choose to approve the proposed development, the following items should be incorporated into the site design and reflected on the record plan by note or illustration. All applicable agreements (i.e. letter agreements for off-site improvements and traffic signal agreements) should be executed prior to entrance plan approval for the proposed development.

1. The developer should enter into an agreement with DelDOT to fund the construction of a grade-separated intersection at the intersection of Delaware Route 1 and Cave Neck Road. The existing full-movement crossover at the intersection would be closed. A detailed concept of the grade-separation is enclosed. The developer should coordinate with DelDOT's Subdivision Section on the details of the funding and implementation of the grade-separation.

2. To determine the location and feasibility of a potential temporary signal on Delaware Route 1 at the southern site access, the developer should complete a signal justification study for the southern site access on Delaware Route 1, as mentioned above. DelDOT will require completion of this study before they issue a letter of no objection for the proposed development. The scope of this study is enclosed with this letter.

3. If the proposed development is to open before the grade separation is complete and, upon completion of the signal justification study, the location deemed to be most appropriate for a temporary signalized access on Delaware Route 1 is directly across from Cave Neck Road, the developer should construct the new signalized intersection in the following manner:

Approach	Current Configuration	Proposed Configuration
Eastbound Cave Neck Road	One shared left-turn / through / right-turn lane	One left-turn lane, one through lane, one right-turn lane
Westbound Site Entrance	N/A	Two left-turn lanes, one through lane, one right turn lane
Northbound Delaware Route 1	One left-turn lane, two through lanes	Two left-turn lanes, two through lanes, one right-turn lane
Southbound Delaware Route 1	One left-turn lane, two through lanes	Two left-turn lanes, two through lanes, one right-turn lane

The proposed storage lengths of the turn lanes are shown in the table below:

Approach	Left-Turn Lane(s)	Right-Turn Lane(s)
Eastbound Cave Neck Road	470 feet*	470 feet*
Westbound Site Entrance	420 feet*	380 feet*
Northbound Delaware Route 1	845 feet*	845 feet*
Southbound Delaware Route 1	630 feet*	630 feet*

* Note: Based on the 95th percentile queue length as reported by HCS 2010.

4. If the proposed development is to open before the grade separation is complete and, upon completion of the signal justification study, the location deemed to be most appropriate for a potential temporary signalized access on Delaware Route 1 is not directly across from Cave Neck Road, the developer should contact DelDOT's Subdivision and Traffic Sections to determine an acceptable design for the subject intersection.

5. Should a temporary signal at the site entrance on Delaware Route 1 be granted, the developer should enter into a traffic signal agreement with DelDOT for the subject intersection. This agreement would cover a temporary signal that may be installed at the intersection before completion of the grade-separation. As mentioned above, the developer has pledged $8 million toward the construction of the grade-separated intersection. DelDOT would require documentation that the $8 million has been expended on that construction as a pre-condition for activating the signal and allowing the development to open with an entrance there. When the grade-separation becomes operational, the temporary signal and any associated left-turn or through lanes would be removed. The installation, maintenance, and removal of the temporary signal and its associated left-turn or through lanes would be entirely funded by the developer. Those costs would be over and above the $8 million. The developer should coordinate with DelDOT on the details of this signal agreement.

6. The developer should construct the northern site access so that it contains an exclusive right-turn lane exiting the site onto northbound Delaware Route 1. Depending on the location of the potential signalized access on Delaware Route 1, the northern access may not be feasible upon the initial opening of the proposed development, and its construction would have to be deferred until the completion of the grade-separated intersection. The developer should coordinate with DelDOT's Subdivision Section on the details of the design of this entrance.

7. At the intersection of Cave Neck Road and Sweetbriar Road, the developer should reconfigure the northbound Sweetbriar Road approach so that it contains a shared left-turn / through lane and a separate right-turn lane. The proposed storage lengths of the turn lanes are shown in the table below:

Approach	Left-Turn Lane	Right-Turn Lane
Northbound Sweetbriar Road	N/A	210 feet*

* Note: Based on the 95th percentile queue length as reported by HCS 2010.

8. The following bicycle, pedestrian, and transit improvements should be included:

   a. Appropriate directional arrows, striping (including stop bars), and signing should be included along right-turn lanes within the project limits.
   b. Utility covers should be made flush with the pavement.
   c. Bike parking should be provided near the building entrances within this development. Where the building architecture provides for an awning or other overhang, the bike parking should be covered.
   d. ADA-compliant curb ramps and crosswalks should be provided at all pedestrian crossings, including all site entrances. Type 3 curb ramps are discouraged.
   e. Internal sidewalks for pedestrian safety and to promote walking as a viable transportation alternative should be constructed within the development. These sidewalks should each be a minimum of five feet wide (with a minimum of a five-foot buffer from the roadway) and should meet current AASHTO and ADA standards.
   f. Where internal sidewalks are located alongside of parking spaces, a buffer should be added to eliminate vehicular overhang onto the sidewalk.
   g. The developer should coordinate with the Delaware Transit Corporation regarding the possibility of installing a bus-stop and its related facilities within the site.

Improvements in this TIS may be considered "significant" under DelDOT's *Work Zone Safety and Mobility Procedures and Guidelines*. These guidelines are available on DelDOT's website at http://www.deldot.gov/information/pubs_forms/manuals/de_mutcd/index.shtml. For any additional information regarding the work zone impact and mitigation procedures during construction please contact Mr. Adam Weiser of DelDOT's Traffic Section. Mr. Weiser can be reached at (302) 659-4073 or by email at Adam.Weiser@state.de.us.

Please note that this review generally focuses on capacity and level of service issues; additional safety and operational issues will be further addressed through DelDOT's subdivision review process.

Additional details on our review of this TIS are attached. If you have any questions concerning this review, please contact me at (302) 760-2167. My email is Troy.Brestel@state.de.us.

Sincerely,

Troy Brestel
Project Engineer

TEB:km
Enclosures
cc with enclosures:
Mr. Lawrence Lank, Sussex County Planning and Zoning
Mr. Frederick H. Schranck, Deputy Attorney General
Mr. Robert McCleary, Director, Transportation Solutions (DOTS)
Mr. Drew Boyce, Director, Planning
Mr. Mark Luszcz, Chief Traffic Engineer, Traffic, DOTS
Mr. Michael Simmons, Assistant Director, Project Development South, DOTS
Mr. J. Marc Coté, Assistant Director, Development Coordination
Mr. T. William Brockenbrough, Jr., County Coordinator, Development Coordination
Mr. Thomas E. Meyer, Traffic Studies Manager, Traffic, DOTS
Mr. Adam Weiser, Safety Engineer, Traffic, DOTS
Mr. Jeff Reed, South District Engineer, South District, DOTS
Mr. Marvin Roberts, South District Public Works Manager, South District, DOTS
Mr. Gemez Norwood, South District Permit Supervisor, South District, DOTS
Mr. Wayne Henderson, Service Development Planner, Delaware Transit Corporation
Mr. Marco Boyce, Planning Supervisor, Statewide & Regional Planning
Ms. Donna Robinson, Administrative Assistant, Traffic, DOTS
Mr. Steven Sisson, Sussex County Subdivision Coordinator, Development Coordination
Mr. John Fiori, Subdivision Manager, Development Coordination
Mr. Chris Sylvester, Traffic Engineer, Traffic, DOTS
Mr. Claudy Joinville, Project Engineer, Development Coordination

General Information

Report date: May 29, 2014
Prepared by: The Traffic Group, Inc.
Prepared for: Trout Development
Tax parcels: 235-23.00-1.00
Generally consistent with DelDOT's *Standards and Regulations for Subdivision Streets and State Highway Access*: Yes

Project Description and Background

Description: The proposed commercial development would consist of 857,000 square feet of commercial space.
Location: Overbrook Town Center is proposed to be located on the northbound side of Delaware Route 1, north of the City of Lewes in Sussex County.
Amount of land to be developed: approximately 114 acres
Land use approval(s) needed: Subdivision approval, Sussex County land use approval
Proposed completion date: 2020
Proposed access locations: Two access points on Delaware Route 1
Daily Traffic Volumes (per DelDOT 2013 Traffic Summary):

- 2013 Average Annual Daily Traffic on Delaware Route 1: 27393 vpd

Delaware Strategies for State Policies and Spending – 2010 Update

Location with respect to the Strategies for State Policies and Spending Map of Delaware:

The proposed development is located within an Investment Level 3 area.

Investment Level 3

Investment Level 3 Areas generally fall into two categories. The first category covers lands that are in the long-term growth plans of counties or municipalities where development is not necessary to accommodate expected population growth during this five-year planning period (or longer). In these instances, development in Investment Level 3 may be least appropriate for new growth and development in the near term.

The second category includes lands that are adjacent to or intermingled with fast-growing areas within counties or municipalities that are otherwise categorized as Investment Levels 1 or 2. These lands are most often impacted by environmentally sensitive features, agricultural-preservation issues, or other infrastructure issues. In these instances, development and growth may be appropriate in the near term, but the resources on the site and in the surrounding area should be carefully considered and accommodated by state Agencies and local governments with land-use authority.

Proposed Development's Compatibility with Strategies for State Policies and Spending:

The proposed development is located within an Investment Level 3 area, and is to be developed as commercial space. This type of development is consistent with the character of a Second Category Investment Level 3 area. It is therefore concluded that the proposed development generally complies with the policies stated in the 2010 update of the "Strategies for State Policies and Spending."

Comprehensive Plan

Sussex County Comprehensive Plan:
(Source: Sussex County Comprehensive Plan, 2008 Update)

The proposed development is located in an area with future land use designated as an "Environmentally Sensitive Developing Area."

Environmentally Sensitive Developing Areas are areas that can accommodate development provided special environmental concerns are addressed. A range of housing types should be permitted in Environmentally Sensitive Areas, including single-family homes, townhouses and multi-family units. Retail and office uses are appropriate but larger shopping centers and office parks should be confined to selected locations with access to arterial roads. Careful mixtures of homes with light commercial and institutional uses can be appropriate to provide for convenient services and to allow people to work close to home. Major new industrial uses are not proposed in these areas. Industrial zones are regulated by the Delaware Coastal Zone Act, which restrict heavy industry and bulk transfer.

The parcel is currently zoned AR-1 (Agricultural Residential), and the developer proposes to rezone the land as CR-1 (Commercial-Residential). According to the Comprehensive Plan, this zoning is appropriate under the Future Land Use designation of an Environmentally Sensitive Developing Area.

Proposed Development's Compatibility with Comprehensive Plan: The proposed development is planned as 857,000 square feet of commercial space. Given that the site's future land use designation is an Environmentally Sensitive Developing Area, this development is consistent with the Sussex County Comprehensive Plan.

Transportation Analysis Zones (TAZ)

Transportation Analysis Zones (TAZ) where development would be located: 1249

TAZ Boundaries:

Current employment estimate for TAZ: 49 jobs in 2010
Future employment estimate for TAZ: 898 jobs in 2040
Current population estimate for TAZ: 369 people in 2010
Future population estimate for TAZ: 424 people in 2040
Current household estimate for TAZ: 173 houses in 2010
Future household estimate for TAZ: 205 houses in 2040
Relevant committed developments in TAZ: None
Would the addition of committed developments to current estimates exceed future projections: No
Would the addition of committed developments and the proposed development to current estimates exceed future projections: No for employment, No for households and population

Relevant Projects in the DelDOT Capital Transportation Program (FY 2013 – FY 2018)

DelDOT maintains the Corridor Capacity Preservation Program (CCPP), which is a statewide program intended to manage and preserve the traffic capacity and safety of adopted highway corridors by various means such as limiting access points and using service roads for local vehicle trips. The general purpose of the program is to ensure that existing principal arterial roadways, such as Delaware Route 1, are able to efficiently carry regional traffic without significant impedance from the effects of local development. The program was established in accordance with the provisions of Title 17, Section 145 of the Delaware Code.

Additionally, there is one DelDOT project within the study area, which is the Highway Safety Improvement Program (HSIP) US Route 9 Project. The intersection of US Route 9 and Sweetbriar Road / Dairy Farm Road is part of this project. The goal of the project is to reduce the potential for and severity of crashes at the intersection, as well as to increase capacity at the intersection for future traffic volumes. To accomplish this, it was recommended that the intersection be reconfigured so that each approach contains an exclusive left-turn lane, an exclusive through lane, and an exclusive right-turn lane. Also as part of this work, the east end of Log Cabin Hill Road (Sussex Road 247) is being relocated further north to separate it from southbound queues at the subject intersection. Construction at this intersection is expected to be complete by the end of the 2014 calendar year.

Trip Generation

Trip generation for the proposed development was computed using comparable land uses and equations contained in Trip Generation, Ninth Edition, published by the Institute of Transportation Engineers (ITE). The following land uses were utilized to estimate the amount of new traffic generated for this development:

- Shopping Center (ITE Land Use Code 820)

Table 1
OVERBROOK TOWN CENTER PEAK HOUR TRIP GENERATION

Land Use	Evening Peak Hour			Saturday Mid-Day Peak Hour		
	In	Out	Total	In	Out	Total
857,000 SF of commercial space	1213	1314	2527	1837	1695	3532
Pass-By Trips (PM: 21%, SAT: 21%)	255	276	531	386	356	742
Total Primary Trips	958	1038	1996	1451	1339	2790

Table 2
OVERBROOK TOWN CENTER DAILY TRIP GENERATION

Land Use	Weekday ADT			Saturday ADT		
	In	Out	Total	In	Out	Total
857,000 SF of commercial space	13,719	13,719	27,438	17,882	17,882	35,764

Overview of TIS

Intersections examined:

1) Site Entrance / Cave Neck Road (Sussex Road 88) / Delaware Route 1
2) Delaware Route 1 / Lockerman Road (Sussex Road 14D)
3) Delaware Route 1 / Hudson Road (Sussex Road 258)
4) Delaware Route 1 / Eagles Crest Road (Sussex Road 264) / Oyster Rocks Road
5) Delaware Route 1 / Minos Conaway Road (Sussex Road 265)
6) Delaware Route 1 / Nassau Road (Sussex Road 266B)
7) Delaware Route 1 / Nassau Road / Nassau Park Road (Sussex Road 14B)
8) US Route 9 / Minos Conaway Road
9) US Route 9 / Dairy Farm Road / Sweetbriar Road (Sussex Road 261)
10) US Route 9 / Church Street (Sussex Road 285B)
11) Cave Neck Road / Hudson Road
12) Cave Neck Road / Sweetbriar Road (Sussex Road 261)
13) Cave Neck Road / Diamond Farm Road (Sussex Road 257)
14) Cave Neck Road / Paynter's Boulevard (Entrance to Paynter's Mill)

Conditions examined:

1) 2013 existing conditions (Case 1)
2) 2020 without Overbrook Town Center (Case 2)
3) 2020 with Overbrook Town Center (Case 3)

Peak hours evaluated:

Weekday evening and summer Saturday mid-day peak hours. As this TIS is for a commercial development, traffic counts were conducted from 4:00 PM to 6:00 PM and 10:00 AM to 2:00 PM to reflect traffic conditions when weekday evening traffic and summer Saturday mid-day traffic are at their peak.

Committed development considered:

Future traffic volumes were developed by DelDOT through use of modeling software. These volumes captured the potential traffic generated by anticipated development in the study area through 2020.

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: The Delaware Transit Corporation (DTC) has one route during the seasonal period (Late May – Beginning of September) that has service within the study area, which is Route 305.

Planned transit service: Mr. Wayne Henderson, a Service Development Planner for the DTC, provided comments regarding DTC's future plans for transit services in this area. Mr. Henderson confirmed that no additional transit routes are planned within the study area in the near future.

Existing bicycle and pedestrian facilities: According to the Sussex County Bicycle Map, there are no specified bicycle routes near to the proposed entrance locations.

Planned bicycle and pedestrian facilities: Comments related to planned bicycle and pedestrian facilities will be made during the plan review process.

Previous Comments

All comments from DelDOT's Scoping Letter, Traffic Count Review, and Preliminary TIS (PTIS) Review were addressed in the Final TIS submission.

General HCS Analysis Comments

There are no general comments. Please refer to the footnotes found at the bottom of the attached LOS tables.

Table 3
PEAK HOUR LEVELS OF SERVICE (LOS)
Overbrook Town Center - TIS
Prepared by The Traffic Group, Inc.

Unsignalized Intersection[1]	**LOS per TIS**		**LOS per DelDOT**	
Delaware Route 1 / North Site Entrance	Weekday PM	Saturday Mid-Day	Weekday PM	Saturday Mid-Day
2020 with development				
Westbound Site Entrance	C (15.9)	F (103.2)	C (22.0)	F (164.2)

[1] The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

Table 4
PEAK HOUR LEVELS OF SERVICE (LOS)
Overbrook Town Center - TIS
Prepared by The Traffic Group, Inc.

Unsignalized Intersection[1]	**LOS per TIS**		**LOS per DelDOT**	
Delaware Route 1 / Cave Neck Road / South Site Entrance	Weekday PM	Saturday Mid-Day	Weekday PM	Saturday Mid-Day
2013 Existing				
Eastbound Cave Neck Road	D (34.7)	F (132.3)	C (18.8)	F (75.8)
Northbound Delaware Route 1 Left-Turn	B (12.2)	D (33.6)	B (13.2)	E (43.7)
Southbound Delaware Route 1 Left-Turn	B (10.8)	C (15.9)	B (11.2)	C (17.2)
2020 without development				
Eastbound Cave Neck Road	F (50.7)	F (776.4)	C (24.9)	F (*)
Northbound Delaware Route 1 Left-Turn	B (14.2)	F (87.8)	C (15.9)	F (144.2)
Southbound Delaware Route 1 Left-Turn	B (11.8)	C (19.8)	B (12.3)	C (21.9)
2020 with development[2]				
Eastbound Cave Neck Road	N/A	N/A	F (320.5)	F (*)
Westbound Site Entrance	N/A	N/A	C (22.4)	F (185.6)
2020 with development with roundabout at the grade-separated intersection ramp with Cave Neck Road[3]				
Eastbound Cave Neck Road	N/A	N/A	C (18.6)	F (146.6)
Westbound Site Entrance	N/A	N/A	C (22.4)	F (185.6)

[1] The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.
[2] For this scenario, grade-separation of the intersection would be constructed, and left-turn movements at the intersection would be eliminated.
[3] For this scenario, a roundabout would be constructed at the intersection of the grade-separated ramp and Cave Neck Road, and a right-turn bypass lane from the ramp onto Southbound DE 1 would be constructed to promote free-flow movement of right turns at the intersection.

Table 5
PEAK HOUR LEVELS OF SERVICE (LOS)
Overbrook Town Center - TIS
Prepared by The Traffic Group, Inc.

Roundabout[1]	**LOS per TIS**		**LOS per DelDOT**	
Cave Neck Road / Grade-Separated Intersection Ramp	Weekday PM	Saturday Mid-Day	Weekday PM	Saturday Mid-Day
2020 with development	N/A	N/A	C (17.18)	F (59.23)

Table 6
PEAK HOUR LEVELS OF SERVICE (LOS)
Overbrook Town Center - TIS
Prepared by The Traffic Group, Inc.

Signalized Intersection[1]	**LOS per TIS**		**LOS per DelDOT**	
Cave Neck Road / Delaware Route 1	Weekday PM	Saturday Mid-Day	Weekday PM	Saturday Mid-Day
2020 with development[2]	N/A	N/A	D (52.8)	F (330.7)

[1] The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.
[2] For this scenario, the lane configuration would be as mentioned in Item 3 on Page 4.

Table 7
PEAK HOUR LEVELS OF SERVICE (LOS)
Overbrook Town Center - TIS
Prepared by The Traffic Group, Inc.

Unsignalized Intersection[1]	**LOS per TIS**		**LOS per DelDOT**	
Delaware Route 1 / Lockerman Road	Weekday PM	Saturday Mid-Day	Weekday PM	Saturday Mid-Day
2013 Existing				
Westbound Lockerman Road	N/A	F (53.6)	C (24.4)	F (59.5)
Northbound Delaware Route 1 Left-Turn	B (10.4)	C (19.1)	B (10.8)	C (20.7)
Southbound Delaware Route 1 Left-Turn	B (10.7)	C (16.3)	B (11.2)	C (17.5)
2020 without development				
Westbound Lockerman Road	D (26.8)	E (49.4)	C (21.4)	F (55.0)
Northbound Delaware Route 1 Left-Turn	B (11.3)	C (24.9)	B (11.9)	D (27.5)
Southbound Delaware Route 1 Left-Turn	B (11.6)	C (20.1)	B (12.3)	C (21.9)
2020 with development				
Westbound Lockerman Road	C (24.7)	F (71.6)	D (27.2)	F (83.2)
Northbound Delaware Route 1 Left-Turn	B (12.8)	D (33.1)	B (13.7)	E (37.4)
Southbound Delaware Route 1 Left-Turn	B (13.4)	D (25.8)	B (14.4)	D (28.7)

[1] The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

Table 8
PEAK HOUR LEVELS OF SERVICE (LOS)
Overbrook Town Center - TIS
Prepared by The Traffic Group, Inc.

Unsignalized Intersection[1]	**LOS per TIS**		**LOS per DelDOT**	
Delaware Route 1 / Hudson Road	Weekday PM	Saturday Mid-Day	Weekday PM	Saturday Mid-Day
2013 Existing				
Eastbound Hudson Road	D (34.5)	F (309.6)	E (40.0)	F (448.7)
Westbound Hudson Road	C (23.3)	F (88.1)	D (25.3)	F (115.4)
Northbound Delaware Route 1 Left-Turn	B (10.5)	C (19.0)	B (11.0)	C (21.4)
Southbound Delaware Route 1 Left-Turn	B (11.4)	C (17.2)	B (10.9)	C (17.6)
2020 without development				
Eastbound Hudson Road	F (54.6)	F (949.7)	F (70.0)	F (*)
Westbound Hudson Road	D (29.3)	F (250.5)	D (32.7)	F (384.7)
Northbound Delaware Route 1 Left-Turn	B (11.3)	C (24.9)	B (11.9)	D (28.8)
Southbound Delaware Route 1 Left-Turn	B (12.6)	C (22.4)	B (12.0)	C (23.2)
2020 with development				
Eastbound Hudson Road	F (113.8)	F (*)	F (159.8)	F (*)
Westbound Hudson Road	E (41.3)	F (563.9)	E (47.7)	F (874.2)
Northbound Delaware Route 1 Left-Turn	B (14.8)	D (33.6)	B (13.8)	E (40.6)
Southbound Delaware Route 1 Left-Turn	B (12.9)	D (29.6)	B (14.1)	D (31.3)

[1] The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

Table 9
PEAK HOUR LEVELS OF SERVICE (LOS)
Overbrook Town Center - TIS
Prepared by The Traffic Group, Inc.

Unsignalized Intersection[1]	**LOS per TIS**		**LOS per DelDOT**	
Delaware Route 1 / Eagles Crest Road	Weekday PM	Saturday Mid-Day	Weekday PM	Saturday Mid-Day
2013 Existing				
Eastbound Eagles Crest Road	C (17.9)	F (54.4)	C (18.8)	F (63.0)
Westbound Eagles Crest Road	D (31.5)	F (159.6)	D (34.6)	F (208.7)
Northbound Delaware Route 1 Left-Turn	B (10.4)	C (20.7)	B (10.7)	C (22.7)
Southbound Delaware Route 1 Left-Turn	B (10.7)	C (15.9)	B (11.1)	C (17.0)
2020 without development				
Eastbound Eagles Crest Road	C (24.0)	F (217.7)	D (25.8)	F (282.8)
Westbound Eagles Crest Road	F (50.4)	F (651.3)	F (57.8)	F (819.5)
Northbound Delaware Route 1 Left-Turn	B (11.6)	D (29.0)	B (12.0)	D (32.7)
Southbound Delaware Route 1 Left-Turn	B (11.8)	C (19.9)	B (12.3)	C (21.7)
2020 with development				
Eastbound Eagles Crest Road	D (33.0)	F (531.8)	E (36.1)	F (643.7)
Westbound Eagles Crest Road	F (91.5)	F (*)	F (114.3)	F (*)
Northbound Delaware Route 1 Left-Turn	B (13.3)	E (41.3)	B (14.0)	E (48.2)
Southbound Delaware Route 1 Left-Turn	B (13.7)	D (25.7)	B (14.4)	D (28.5)

[1] The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

Table 10
PEAK HOUR LEVELS OF SERVICE (LOS)
Overbrook Town Center - TIS
Prepared by The Traffic Group, Inc.

Unsignalized Intersection[1]	**LOS per TIS**		**LOS per DelDOT**	
Delaware Route 1 / Minos Conaway Road	Weekday PM	Saturday Mid-Day	Weekday PM	Saturday Mid-Day
2013 Existing				
Eastbound Minos Conaway Road	C (21.9)	E (49.1)	C (24.9)	F (70.9)
Northbound Delaware Route 1 Left-Turn	B (12.2)	D (28.7)	B (13.2)	E (36.9)
Southbound Delaware Route 1 Left-Turn	B (11.7)	C (17.4)	B (12.5)	C (19.9)
2020 without development				
Eastbound Minos Conaway Road	D (33.9)	F (172.4)	E (42.6)	F (981.8)
Northbound Delaware Route 1 Left-Turn	B (14.1)	F (68.1)	C (15.8)	F (120.1)
Southbound Delaware Route 1 Left-Turn	B (12.9)	C (22.3)	B (14.0)	D (26.8)
2020 with development				
Eastbound Minos Conaway Road	F (325.7)	F (*)	F (449.9)	F (*)
Northbound Delaware Route 1 Left-Turn	C (20.8)	F (234.0)	D (25.6)	F (437.1)
Southbound Delaware Route 1 Left-Turn	C (15.8)	D (34.0)	C (17.5)	E (44.0)

[1] The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

Table 11
PEAK HOUR LEVELS OF SERVICE (LOS)
Overbrook Town Center - TIS
Prepared by The Traffic Group, Inc.

Unsignalized Intersection[1]	**LOS per TIS**		**LOS per DelDOT**	
Delaware Route 1 / Nassau Road	Weekday PM	Saturday Mid-Day	Weekday PM	Saturday Mid-Day
2013 Existing				
Westbound Nassau Road	D (29.8)	F (121.1)	C (19.1)	C (22.8)
Northbound Delaware Route 1 Left-Turn	B (10.8)	C (22.4)	B (11.4)	C (24.1)
Southbound Delaware Route 1 Left-Turn	B (12.9)	E (39.0)	B (14.1)	E (47.0)
2020 without development				
Westbound Nassau Road	E (38.0)	F (*)	D (26.5)	F (*)
Northbound Delaware Route 1 Left-Turn	B (11.8)	D (29.8)	B (12.6)	D (32.5)
Southbound Delaware Route 1 Left-Turn	C (15.3)	F (110.9)	C (17.2)	F (147.0)
2020 with development				
Westbound Nassau Road	F (64.0)	F (*)	F (62.9)	F (*)
Northbound Delaware Route 1 Left-Turn	B (14.0)	F (41.7)	C (15.3)	E (46.4)
Southbound Delaware Route 1 Left-Turn	C (24.0)	F (543.5)	D (31.2)	F (653.5)

[1] The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

Table 12
PEAK HOUR LEVELS OF SERVICE (LOS)
Overbrook Town Center - TIS
Prepared by The Traffic Group, Inc.

Unsignalized Intersection[1]	**LOS per TIS**		**LOS per DelDOT**	
Delaware Route 1 / Nassau Road / Nassau Park Road	Weekday PM	Saturday Mid-Day	Weekday PM	Saturday Mid-Day
2013 Existing				
Eastbound Nassau Park Road	C (22.9)	F (63.9)	E (38.6)	F (181.6)
Westbound Nassau Road	F (57.1)	F (158.0)	F (70.8)	F (267.6)
Northbound Delaware Route 1 Left-Turn	B (11.8)	C (23.3)	B (12.2)	D (27.7)
Southbound Delaware Route 1 Left-Turn	B (11.5)	C (16.4)	B (12.3)	C (18.7)
2020 without development				
Eastbound Nassau Park Road	D (33.0)	F (326.4)	F (93.2)	F (*)
Westbound Nassau Road	F (115.6)	F (929.5)	F (164.5)	F (*)
Northbound Delaware Route 1 Left-Turn	B (12.8)	C (20.1)	B (13.5)	E (45.0)
Southbound Delaware Route 1 Left-Turn	B (12.7)	D (34.4)	B (13.7)	C (23.7)
2020 with development				
Eastbound Nassau Park Road	F (64.4)	F (*)	F (288.6)	F (*)
Westbound Nassau Road	F (290.4)	F (*)	F (490.7)	F (*)
Northbound Delaware Route 1 Left-Turn	C (16.1)	D (27.9)	C (17.5)	F (79.3)
Southbound Delaware Route 1 Left-Turn	B (15.0)	F (53.6)	C (16.6)	D (34.5)

[1] The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

Table 13
PEAK HOUR LEVELS OF SERVICE (LOS)
Overbrook Town Center - TIS
Prepared by The Traffic Group, Inc.

Unsignalized Intersection[1]	**LOS per TIS**		**LOS per DelDOT**	
US Route 9 / Minos Conaway Road	Weekday PM	Saturday Mid-Day	Weekday PM	Saturday Mid-Day
2013 Existing				
Eastbound US Route 9 Left-Turn	A (8.9)	A (9.2)	A (8.9)	A (9.2)
Westbound US Route 9 Left-Turn	A (8.3)	A (9.1)	A (8.3)	A (9.3)
Northbound Lakeview Boulevard	B (13.7)	C (15.8)	B (13.1)	C (16.8)
Southbound Minos Conaway Road	C (16.7)	D (34.8)	C (16.9)	E (42.3)
2020 without development				
Eastbound US Route 9 Left-Turn	A (9.3)	A (9.6)	A (9.4)	A (9.7)
Westbound US Route 9 Left-Turn	A (8.5)	A (9.6)	A (8.6)	A (9.8)
Northbound Lakeview Boulevard	C (18.3)	C (25.0)	C (16.8)	D (27.3)
Southbound Minos Conaway Road	D (25.4)	F (88.7)	D (25.8)	F (130.9)
2020 with development				
Eastbound US Route 9 Left-Turn	A (9.3)	A (9.6)	A (9.4)	A (9.7)
Westbound US Route 9 Left-Turn	A (8.5)	A (9.6)	A (8.6)	A (9.8)
Northbound Lakeview Boulevard	C (18.3)	C (25.0)	C (16.8)	D (27.3)
Southbound Minos Conaway Road	D (25.4)	F (88.7)	D (25.8)	F (130.9)

[1] The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

Table 14
PEAK HOUR LEVELS OF SERVICE (LOS)
Overbrook Town Center - TIS
Prepared by The Traffic Group, Inc.

Signalized Intersection[1]	**LOS per TIS**		**LOS per DelDOT**	
US Route 9 / Sweetbriar Road / Dairy Farm Road	Weekday PM	Saturday Mid-Day	Weekday PM	Saturday Mid-Day
2013 Existing	C (24.1)	C (32.7)	C (26.3)	C (24.2)
2020 without development	C (31.6)	F (110.5)	C (33.5)	D (48.0)
2020 with development	F (104.4)	F (300.8)	F (189.4)	F (462.8)
2020 with development with implementation of HEP Project[2]	C (28.9)	D (38.4)	C (24.9)	C (32.5)

[1] The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.
[2] The HEP project includes configuring each approach to consist of one left-turn lane, one through lane, and one right-turn lane.

Table 15
PEAK HOUR LEVELS OF SERVICE (LOS)
Overbrook Town Center - TIS
Prepared by The Traffic Group, Inc.

Unsignalized Intersection[1]	**LOS per TIS**		**LOS per DelDOT**	
US Route 9 / Church Street	Weekday PM	Saturday Mid-Day	Weekday PM	Saturday Mid-Day
2013 Existing				
Westbound US Route 9 Left-Turn	A (8.4)	A (9.6)	A (8.6)	A (9.7)
Northbound Church Street	C (15.1)	D (28.6)	C (15.8)	D (28.9)
2020 without development				
Westbound US Route 9 Left-Turn	A (8.7)	B (10.4)	A (8.8)	B (10.5)
Northbound Church Street	C (18.9)	E (49.1)	C (20.8)	E (49.6)
2020 with development				
Westbound US Route 9 Left-Turn	A (8.7)	B (10.4)	A (8.8)	B (10.5)
Northbound Church Street	C (18.9)	E (49.1)	C (20.8)	E (49.6)

[1] The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

Table 16
PEAK HOUR LEVELS OF SERVICE (LOS)
Overbrook Town Center - TIS
Prepared by The Traffic Group, Inc.

Unsignalized Intersection[1]	**LOS per TIS**		**LOS per DelDOT**	
Cave Neck Road / Hudson Road	Weekday PM	Saturday Mid-Day	Weekday PM	Saturday Mid-Day
2013 Existing				
Eastbound Cave Neck Road Left-Turn	A (7.6)	A (7.6)	A (7.6)	A (7.5)
Westbound Cave Neck Road Left-Turn	A (7.6)	A (7.6)	A (7.6)	A (7.7)
Northbound Hudson Road	B (12.0)	B (11.4)	B (12.3)	B (11.6)
Southbound Hudson Road	B (12.9)	B (11.9)	B (13.4)	B (12.1)
2020 without development				
Eastbound Cave Neck Road Left-Turn	A (7.7)	A (7.7)	A (7.7)	A (7.6)
Westbound Cave Neck Road Left-Turn	A (7.7)	A (7.7)	A (7.7)	A (7.7)
Northbound Hudson Road	B (13.6)	B (12.5)	B (14.2)	B (12.8)
Southbound Hudson Road	B (14.7)	B (12.9)	C (15.5)	B (13.1)
2020 with development				
Eastbound Cave Neck Road Left-Turn	A (7.9)	A (8.0)	A (8.0)	A (7.9)
Westbound Cave Neck Road Left-Turn	A (7.9)	A (8.1)	A (8.0)	A (8.2)
Northbound Hudson Road	C (17.3)	C (16.7)	C (18.6)	C (17.5)
Southbound Hudson Road	C (19.3)	C (17.6)	C (21.0)	C (18.2)

[1] The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

Table 17
PEAK HOUR LEVELS OF SERVICE (LOS)
Overbrook Town Center - TIS
Prepared by The Traffic Group, Inc.

Unsignalized Intersection[1]	**LOS per TIS**		**LOS per DelDOT**	
Cave Neck Road / Sweetbriar Road	Weekday PM	Saturday Mid-Day	Weekday PM	Saturday Mid-Day
2013 Existing				
Eastbound Cave Neck Road Left-Turn	A (7.6)	A (7.4)	A (7.6)	A (7.5)
Westbound Cave Neck Road Left-Turn	A (7.7)	A (7.7)	A (7.6)	A (7.6)
Northbound Sweetbriar Road	B (14.4)	B (12.2)	B (14.3)	B (12.1)
Southbound Sweetbriar Road	B (13.8)	B (11.8)	B (13.9)	B (11.7)
2020 without development				
Eastbound Cave Neck Road Left-Turn	A (7.4)	A (7.5)	A (7.7)	A (7.6)
Westbound Cave Neck Road Left-Turn	A (7.7)	A (7.8)	A (7.8)	A (7.8)
Northbound Sweetbriar Road	C (18.0)	B (14.3)	C (17.9)	B (14.0)
Southbound Sweetbriar Road	C (16.2)	B (13.5)	C (16.3)	B (13.3)
2020 with development				
Eastbound Cave Neck Road Left-Turn	A (8.0)	A (7.9)	A (8.0)	A (7.9)
Westbound Cave Neck Road Left-Turn	A (8.7)	A (9.1)	A (8.6)	A (8.9)
Northbound Sweetbriar Road	F (260.3)	F (284.1)	F (257.6)	F (227.9)
Southbound Sweetbriar Road	F (79.9)	F (104.5)	F (82.5)	F (85.6)
2020 with development with improvements[2]				
Eastbound Cave Neck Road Left-Turn	N/A	N/A	A (8.0)	A (7.9)
Westbound Cave Neck Road Left-Turn	N/A	N/A	A (8.6)	A (8.9)
Northbound Sweetbriar Road	N/A	N/A	F (88.6)	F (56.3)
Southbound Sweetbriar Road	N/A	N/A	F (82.5)	F (85.6)

[1] The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.
[2] Improvements include modification of the northbound Sweetbriar Road approach to contain a shared left-turn / through lane and a separate right-turn lane.

Table 18
PEAK HOUR LEVELS OF SERVICE (LOS)
Overbrook Town Center - TIS
Prepared by The Traffic Group, Inc.

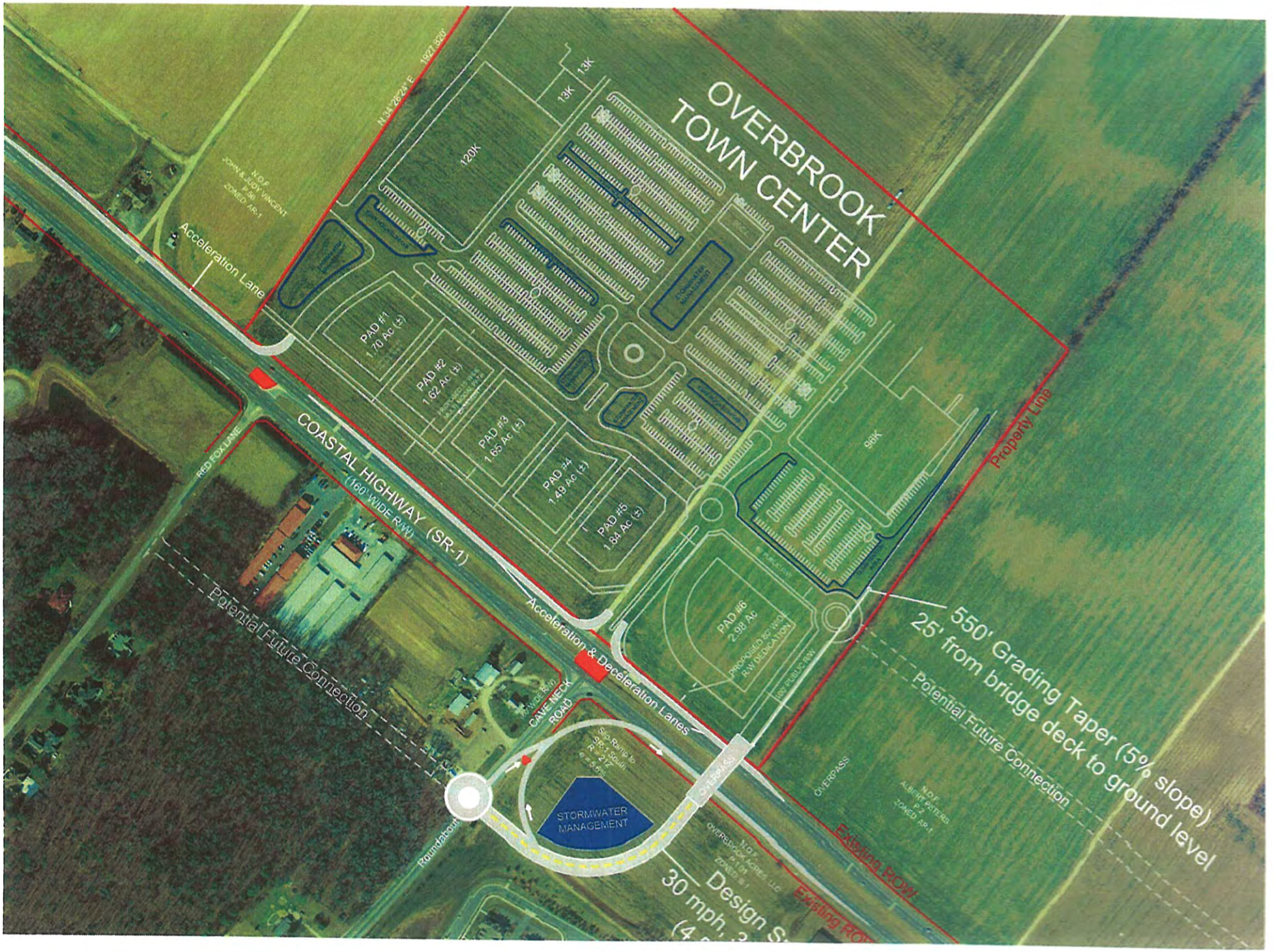
Unsignalized Intersection[1]	**LOS per TIS**		**LOS per DelDOT**	
Cave Neck Road / Diamond Farm Road	Weekday PM	Saturday Mid-Day	Weekday PM	Saturday Mid-Day
2013 Existing				
Eastbound Cave Neck Road Left-Turn	A (7.7)	A (7.5)	A (7.7)	A (7.5)
Westbound Cave Neck Road Left-Turn	A (7.7)	A (7.6)	A (7.6)	A (7.6)
Northbound Diamond Farm Road	B (11.6)	B (10.8)	B (11.5)	B (10.8)
Southbound Diamond Farm Road	B (10.6)	B (11.0)	B (10.7)	B (10.8)
2020 without development				
Eastbound Cave Neck Road Left-Turn	A (7.8)	A (7.6)	A (7.8)	A (7.6)
Westbound Cave Neck Road Left-Turn	A (7.8)	A (7.7)	A (7.7)	A (7.7)
Northbound Diamond Farm Road	B (12.8)	B (11.6)	B (12.7)	B (11.1)
Southbound Diamond Farm Road	B (11.5)	B (11.7)	B (11.5)	B (11.0)
2020 with development				
Eastbound Cave Neck Road Left-Turn	A (8.0)	A (7.9)	A (8.1)	A (8.0)
Westbound Cave Neck Road Left-Turn	A (8.1)	A (8.0)	A (7.9)	A (8.1)
Northbound Diamond Farm Road	C (15.9)	C (15.6)	C (15.7)	B (13.0)
Southbound Diamond Farm Road	B (13.5)	B (13.5)	B (13.5)	B (12.7)

[1] The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

Table 19
PEAK HOUR LEVELS OF SERVICE (LOS)
Overbrook Town Center - TIS
Prepared by The Traffic Group, Inc.

Unsignalized Intersection[1]	**LOS per TIS**		**LOS per DelDOT**	
Cave Neck Road / Paynter's Boulevard	Weekday PM	Saturday Mid-Day	Weekday PM	Saturday Mid-Day
2013 Existing				
Westbound Cave Neck Road Left-Turn	A (7.8)	A (7.6)	A (7.8)	A (7.7)
Northbound Paynter's Boulevard	B (10.4)	A (9.7)	B (10.4)	A (9.9)
2020 without development				
Westbound Cave Neck Road Left-Turn	A (8.0)	A (7.7)	A (8.0)	A (7.8)
Northbound Paynter's Boulevard	B (11.0)	A (10.0)	B (11.0)	B (10.1)
2020 with development				
Westbound Cave Neck Road Left-Turn	A (9.0)	A (9.1)	A (9.0)	A (9.3)
Northbound Paynter's Boulevard	C (17.5)	C (18.0)	C (17.4)	C (19.4)

[1] The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.


OVERBROOK
TOWN CENTER
Acceleration Lane
COASTAL HIGHWAY (SR-1)
(160' WIDE R/W)
RED FOX LANE
PAD #1
1.70 Ac (±)
PAD #2
1.62 Ac (±)
PAD #3
1.65 Ac (±)
PAD #4
1.49 Ac (±)
PAD #5
1.84 Ac (±)
PAD #6
2.98 Ac
120K
13K
13K
98K
Property Line
Acceleration & Deceleration Lanes
Potential Future Connection
CAVE NECK
ROAD
STORMWATER
MANAGEMENT
Roundabout
OVERPASS
Existing ROW
550' Grading Taper (5% slope)
25' from bridge deck to ground level
Potential Future Connection
Existing ROW
30 mph, 3
Design S

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
800 BAY ROAD
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SHAILEN P. BHATT
SECRETARY

Traffic Section
(302) 659-4060

To: Troy Brestel, Project Engineer
Development Coordination, Division of Planning

From: Christopher N. Sylvester,
Traffic Studies Engineer – DelDOT Traffic Section

Date: August 8th, 2014

RE: Overbrook Towne Center – Traffic Signal Justification Study Scope
Sussex County, Delaware

This memorandum is in reference to the Delaware Department of Transportation (DelDOT) Traffic Section's review of the submitted Traffic Impact Study (TIS) for Overbrook Towne Center, submitted by The Traffic Group, Inc., in regard to the possibility of the installation of a temporary traffic control signal along Delaware Route 1 / Coastal Highway (S14) at the Overbrook Towne Center site entrance, at/or in the vicinity of the intersection with Cave Neck Road (S88). It is the Traffic Section's understanding through discussions with DelDOT Planning Section that prior to the consideration of the installation of a temporary traffic control signal at the abovementioned location, representatives of Overbrook Towne Center will need to provide evidence as listed in the DelDOT TIS Scoping Letter that the proposed interchange for DE Route 1 / Coastal Highway (S14) and Cave Neck Road (S14) will not be completed and open to users by identified completion dates. In order for the DelDOT Traffic Section to consider the possibility of the implementation of a temporary traffic control signal on Delaware Route 1 / Coastal Highway (S14) at Overbrook Towne Center, a Traffic Signal Justification Study will need to be completed.

The following is a general list of what the DelDOT Traffic Section is requiring to be included in a Traffic Signal Justification Study, although additional items may be required to be included

in the Traffic Signal Justification Study depending on the timeframe in which the study is completed:

- ❖ Analysis of both the existing conditions and proposed conditions for each location evaluated for each of the below items:
  - Approach lane widths
  - Approach lane configurations
  - Location and lengths of exclusive turn lanes (storage and taper length should be noted separately)
  - Other geometric features
  - Horizontal and vertical geometry (description)
  - Roadside features
  - Adjacent land use
  - Pedestrian use: If applicable, evaluate the impact a pedestrian crosswalk may have at the subject intersection. A recommended location for the crosswalk(s) should be provided, considering both pedestrian path desire lines and the impact to vehicular traffic. The study should take into consideration NCHRP Report 562.
- ❖ Analysis of Turning Movement Count Data for each location evaluated:
  - Existing volumes (Twelve (12) hours)
  - Proposed volumes and proposed hourly volumes based on ITE trip generation.
- ❖ Crash History Data for each location evaluated:
  - Obtain at least three (3) years of data to be used for the Traffic Signal Warrant Analysis.
- ❖ Traffic Signal Warrant Analysis for each location evaluated:
  - Analyze when considering signalization related to development:
    a) Existing conditions (Is a signal warranted now?).
    b) Various phases/build out of the site (At what point of the build out will the signal be warranted?).
    c) Complete build out of the site.
    d) Future conditions, including completed build out of the site.
    e) Future conditions, including complete build out of the site, as well as other projects that may add volumes to the intersection.
  - All nine (9) warrants provided in the 2011 Delaware Manual on Uniform Traffic Control Devices should be evaluated. Some may not be applicable to the specific location being studied, but should be address with statements of why it is not applicable if that is the case.
- ❖ Intersection Capacity Analysis for each location evaluated:

- Evaluate the operation of the intersection based on the outcome of the Traffic Signal Warrant Analysis. If a temporary traffic control signal is warranted, how will it operate? If not, how will it operate?
- Evaluate queue lengths at the impacted intersection.
- Conduct capacity analysis, typically using HCS or Synchro.

❖ Analysis of both the existing conditions and proposed conditions for each location evaluated using the Highway Safety Manual (HSM) – Predictive Method, comparing the following:

- Estimate the expected average crash frequency (per year), crash severity, and collision types.

As for locations to be evaluated as part of the Traffic Signal Justification Study for the feasibility of the implementation of a temporary traffic control signal, representatives of Overbrook Towne Center should provide evidence of selecting various locations and designs that may help reduced the impacts along the DE Route 1 corridor if a temporary traffic control signal is to be installed. At a minimum the DelDOT Traffic Section would like the Traffic Signal Justification Study to include the evaluation of the following locations:

1. At the intersection of DE Route 1 / Coastal Highway (S14) and Cave Neck Road (S88) / Overbrook Towne Center site entrance,
2. At a location located between the two median crossovers located in the vicinity of the development site frontage. For this location specifically, the design of a temporary traffic control signal should be explored including, but not limited to, an "English T" configuration, reducing the number of phases.

If a temporary traffic control signal is found to be justified for the Overbrook Towne Center, the triggers for the removal of such a temporary traffic signal will need to be provided and outlined in detail as part of the Traffic Signal Justification Study.

Please let me know if you should have any questions or comments regarding the comments provided for the Traffic Signal Justification Study provided as part of the TIS review for Overbrook Towne Center.